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[Title of the Invention] Color Conversion System and Color Conversion Server

[Scope of Claims]

[Claim1] A color conversion system in which one or plural client systems and a color conversion server are connected through a communication path, the color conversion system characterized in that the color conversion server stores one or more pieces of color conversion information, which are set so that color output by an output device provided in a client system on a basis of image data is a target color, with associating the color conversion information with the output device in advance; receives instruction information specifying image data and an output device from the client system; performs color conversion processing for the image data using the color conversion information corresponding to the instruction information; and transfers the image data undergone the color conversion processing in accordance with the instruction information.

[Claim2] A color conversion system in which one or plural client systems and a color conversion server are connected through a communication path, the color conversion system characterized in that the color conversion server stores one or more pieces of color conversion information, which are set so that color output by an output device provided in a client

system on a basis of image data is a target color, with associating the color conversion information with the output device in advance, receives instruction information specifying image data and an output device from the client system, and transfers the color conversion information corresponding to the instruction information and the image data in accordance with the instruction information; the client systems perform color conversion processing for the image data with using the color conversion information transferred from the color conversion server.

[Claim 3] The color conversion system according to claim 1 or claim 2, characterized in that the color conversion server stores the color conversion information for respective plural target colors while associating the color conversion information with the output devices; receives information specifying the output device and information specifying the target color as the instruction information; and uses color conversion information corresponding to the information specifying the output device and the information specifying the target color.

[Claim 4] The color conversion system according to any one of claims 1 to claim 3, characterized in that the color conversion server stores the color conversion information with plural ranks corresponding to color conversion accuracy; receives information of the rank together with the information

specifying the output device; uses the color conversion information corresponding to the information specifying the output device and the information of the rank.

[Claim 5] The color conversion system according to any one of claims 1 to claim 4, characterized in that the color conversion server receives information indicating transfer destination of the image data undergone the color conversion as the instruction information, and uses the color conversion information corresponding to the output device specified by the transfer destination.

[Claim 6] The color conversion system according to claim 1, characterized in that the client system downloads the color conversion information from the color conversion server, and sends to the color conversion server the color conversion information corresponding to the output device in the instruction information; and the color conversion server performs the color conversion processing for the image data using the color conversion data of the instruction information.

[Claim 7] The color conversion system according to any one of claim 1 to claim 6, characterized in that the color conversion server further converts the received image data or the image data undergone the color conversion processing into raster data and transfers the converted raster data as the image data undergone the color conversion processing.

[Claim 8] The color conversion system according to any

one of claim 1 to claim 7, characterized in that the color conversion server charges for the color conversion processing.

[Claim 9] The color conversion system according to claim 7, characterized in that the color conversion server charges for the conversion processing or the color conversion processing and the conversion processing.

[Claim 10] A color conversion server characterized by comprising: color conversion information storage means for storing one or more pieces of color conversion information, which are set so that color output by an output device on a basis of image data is a target color, with associating the color conversion information with the output device; communicating means for receiving image data and instruction information specifying image data and an output device, which are sent from outside through a communication path; and color conversion means for performing color conversion processing for the image data using the color conversion information, which correspond to the instruction information and is stored in the color conversion information storage means.

[Claim 11] A color conversion server characterized by comprising: color conversion information storage means for storing one or more pieces of color conversion information, which are set so that color output by an output device on a basis of image data is a target color, with associating the color conversion information with the output device;

communicating means for receiving image data and instruction information specifying image data and an output device, which are sent from outside through a communication path, and transferring the color conversion information and the image data in accordance with the instruction information; color conversion means for extracting the color conversion information, which corresponds to the instruction information and is stored in the color conversion information storage means.

[Claim 12] The color conversion server according to claim 10 or claim 11, characterized in that the color conversion means stores the color conversion information for respective plural target colors while associating the color conversion information with the output devices; the color conversion means receives information specifying the output device and information specifying the target color as the instruction information; and performs the color conversion processing using color conversion information corresponding to the information specifying the output device and the information specifying the target color.

[Claim 13] The color conversion server according to any one of claims 10 to claim 12, characterized in that the color conversion information storage means stores the color conversion information with plural ranks corresponding to color conversion accuracy; the color conversion means receives information of the rank together with the information specifying



the output device, and performs the color conversion processing using the color conversion information corresponding to the information specifying the output device and the information of the rank.

[Claim 14] The color conversion server according to any one of claims 10 to claim 13, characterized in that the color conversion means receives information indicating transfer destination of the image data undergone the color conversion as the instruction information, and uses the color conversion information corresponding to the output device specified by the transfer destination.

[Claim 15] The color conversion server according to claim 10, characterized in that the communication means has a function of transferring the color conversion information in the color conversion information storage means in response to download request of the color conversion information from outside and has a function of receiving the color conversion information as the instruction information; and the color conversion means performs the color conversion processing for the image data using the color conversion data received as the instruction information.

[Claim 16] The color conversion server according to any one of claim 10 to claim 15, characterized in that the color conversion means further converts the received image data or the image data undergone the color conversion processing into

raster data and transfers the converted raster data as the image data undergone the color conversion processing.

[Claim 17] The color conversion server according to any one of claim 10 to claim 16, characterized in that the plurality of color conversion means are provided.

[Claim 18] The color conversion server according to any one of claim 10 to claim 17, characterized in that the image data sent from outside is assigned to the plurality of color conversion means in accordance with their load.

[Claim 19] The color conversion server according to any one of claim 10 to claim 18, characterized by further comprising charge means for charges for the color conversion processing.

[Claim 20] The color conversion server according to claim 16, characterized further comprising charge means for charging for the conversion processing or the color conversion processing and the conversion processing.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

The invention relates to a color conversion system in which one or plural client system and a color conversion server are connected via a communication path and a color conversion server suitably used in such a color conversion system.

[0002]

[Related arts]

To prepare printed matter, steps of planning, design, production, proofreading, plate-making, printing plate, and final printing are executed. Various peoples and enterprises are involved in the steps. FIG. 5 is an explanatory drawing showing an example of an outline of a production process of general printed matter. In the figure, numeral 61 denotes a client, numeral 62 denotes a production company, numeral 63 denotes a plate-making company, numeral 64 denotes a printing company, numeral 71 denotes a production system, numeral 72 denotes a comprehensive layout, numeral 81 denotes an image setter, numeral 82 denotes a film, numeral 83 denotes plate-making, numeral 84 denotes a PS plate, numeral 85 denotes a flatbed proofreading machine, numeral 86 denotes proof, numeral 91 denotes a printer, and numeral 92 denotes printed matter. The production company 62 determines the concept of printed matter with the client 61 and uses the production system 71, etc., to design the printed matter. At this time, the image (outline) of the printed matter designed is converted into raster data in the production system 71 and color conversion processing, etc., is performed and then the result is output on a printer in the production system 71 to prepare the comprehensive layout 72. Using the comprehensive layout 72, the production company 62 makes arrangements with the client 61 for determining the specific printed matter image (outline). If the production company 62 comes to an agreement with the client 61 using the

comprehensive layout 72, the image data in the production system 71 at the time is passed to the plate-making company 63.

[0003]

In the plate-making company 63, an image is provided by the image setter 63, for example, based on the image data passed from the production company 62 and color conversion processing, etc., is performed and color films 82 of Y, M, C, and K, for example, are prepared. In the plate-making 83, the films 82 are burnt into the PS plates 84. A printing plate may be prepared directly from the image data passed from the production company 62 by CTP (computer to plate).

[0004]

The PS plates 84 thus prepared can be used to print on the printer 91; final proofreading is executed before actual printing is executed. Thus, using the PS plates 84, the proof 86 is prepared with the flatbed proofreading machine of a manual printer and consent of the client 61 is obtained. To make a correction at this point in time, the process is again executed starting at preparation of the films 82.

[0005]

If consent of the client 61 is obtained and the proof is OKed, the proof 86 and the films 82 are brought into the printing company 64 and in the printing company 64, the PS plates 84 are prepared and the printed matter 92 is printed on the printer 91. At this time, the printer 91 is adjusted so that

the color of the printed matter 92 becomes almost the same as the color of the proof 86. After this, cutting, binding, and the like are performed to complete final printed matter.

[0006]

In such a printing process, the client 61 makes a final check using the proof 86, because the proof 86 has color reproducibility closest to the finished quality of the final printed matter 92. In the related art, the sales representative in the production company or the plate-making company takes the proof 86 with him or her to the client 61 for obtaining consent of the client 61; this is a large burden from the points of costs and time. To make a correction, it is necessary to again execute the process starting at preparation of the films 82 and there is a problem of the long process at high costs.

[0007]

The comprehensive layout 72 is also prepared in the production company 62 and it is also possible to execute the final proofreading using the comprehensive layout 72. In fact, however, the color conversion characteristic in the production system 71 and the color reproduction characteristic of the printer differ from the color characteristic in the process of preparing the proof 86 and therefore the comprehensive layout 72 and the proof 86 vary in hue or tint even if the same image data is used. Thus, if the proof is OKed in the state of the comprehensive layout 72 and printing is executed as it is, the

hue or tint of the printed matter may differ from that at the proofreading time and the client 61 will make an objection. Therefore, it is impossible to execute the final proofreading using the comprehensive layout 72; this is a problem.

[0008]

If the proof 86 can be output on a printer owned by the client 61, the labor and time for the sales representative to visit the client 61 can be eliminated. However, in this case, it is unassured that color reproduction characteristics of the printer owned by the client 61 are the same as those of the proof 86 created in the plate-making company 63, and it is impossible to use output of the printer owned by the client 61 in place of the proof 86.

[0009]

In recent years, an apparatus for preparing a proof responsive to the used printer based on the image data prepared in the production company 62 (DDCP) has also been developed. The apparatus can be used to prepare the proof 86 without preparing the films 82 or the PS plates 84, and the proofreading cost can be reduced. A similar apparatus is installed, whereby the proof 86 can also be output in any other than the plate-making company. However, such an apparatus is very expensive and the production company or the client cannot afford to install the apparatus. Therefore, the process in which the plate-making company 63 prepares the proof 86 and presents the proof 86 to

the client 61 in the related art as described above cannot be changed.

[0010]

[Problem to be Solved by the Invention]

In view of the above-described circumstances, the invention has been made, and it is an object of the invention to provide a color conversion system, which can obtain an image of a printed matter, which has the same color reproduction as the final printed matter, at any stage and with any output device, and a color conversion server, which can be used in such a color conversion system.

[0011]

[Means for Solving the Problem]

In the invention, one or more pieces of color conversion information, which are set so that color output by an output device provided in a client system on a basis of image data is a target color, are stored in a color conversion server in advance, with associating the color conversion information with the output device. Then, the color conversion server receives instruction information specifying image data and an output device from the client system, performs color conversion processing for the image data using the color conversion information corresponding to the instruction information, and transfers the image data undergone the color conversion processing in accordance with the instruction information. If

the output device in the client system outputs based on the transferred image data undergone the color conversion processing, an output color matches the target color because color of an image has been converted to be the target color. Alternatively, the color conversion server transfers the color conversion information corresponding to the instruction information together with the image data to the output device in the client system. The output device in the client system performs color conversion processing for the image data on a basis of the transferred color conversion information, and outputs. The color conversion information is provided for converting image data so as to be the target color, and thus the output color matches the target color. Therefore, if the target color is matched with the reproduced color on a proof, the color of the image output from the output device always matches the proof.

[0012]

For example, in a case of printing out the image data, which is prepared in the production company, on the printer installed in the client, the image data is sent to the color conversion server and color conversion processing is performed using the color conversion information corresponding to the printer installed in the client. Alternatively, the color conversion information is received from the color conversion server and color conversion processing is performed in the



printer. Thereby, if the image data undergone the color conversion processing is printed out on the printer installed in the client, an image is reproduced in the same color as the proof. Accordingly, it is made possible for the client to obtain the image reproduced in almost the same color as the proof without preparing films, PS plates, etc., and without the need for installing an expensive apparatus, and it is made possible to conduct color proofreading using the proof based on output of the printer installed in the client.

[0013]

For example, in a case of printing out the image data, which is prepared in the production company, on the printer installed in the production company, a similar manner is also applied. The image data is sent to the color conversion server, and color conversion processing is performed using the color conversion information corresponding to the printer installed in the production company. Thereby, if the image data undergone the color conversion processing is printed out on the printer installed in the production company, an image is reproduced in the same color as the proof. Accordingly, the comprehensive layout in the related art can be used as a proof intact and up to the final color proofreading can be accomplished.

[0014]

Further, color proofreading similar to that using a proof on the printer installed in the production company or the client

is executed, whereby it becomes unnecessary to output a proof using a flatbed proofreading machine, etc., which consume time at the plate-making time, and the need for again preparing films, PS plates, etc., from beginning based on proofreading is eliminated; it is made possible to reduce the time and the costs.

[0015]

The color reproduced on a proof often varies from one used printer to another. To cope with such a case, color conversion information may be provided for each target color corresponding to the reproduced color on a proof corresponding to a plurality of printers as target colors and color conversion processing may be performed using the color conversion information corresponding to the information specifying the output device and the information specifying the target color.

[0016]

Plural pieces of color conversion information corresponding to ranks in color conversion accuracy are provided and the rank information together with the information specifying the output device as the instruction information are sent from the client system to the color conversion server, whereby color conversion processing corresponding to rank can be performed. Accordingly, the color conversion processing with the color conversion accuracy responsive to the printed matter preparation stage can be performed and, for example, the color conversion accuracy is degraded at the initial stage

of design, so that the processing can be speeded up and the processing load can be lessened.

[0017]

Further, the color conversion information provided in the color conversion server is previously downloaded into the client system and when the center sever is requested to perform color conversion processing for the image data, the color conversion information corresponding to the output device may also be sent to the color conversion server and color conversion processing may also be performed in the color conversion server using the color conversion information.

[0018]

Further, the color image processing system can also be configured so that the image data is converted into raster data in the color conversion server and the converted raster data is transferred as the image data undergone color conversion processing. For example, if the output device installed in the client system cannot produce precise output because of no fonts, etc., the image data is converted into raster data in the color conversion server, whereby it is made possible to reproduce an image of a printed matter.

[0019]

A charge is made for such color conversion processing, conversion processing into raster data, or a combination thereof, whereby it is made possible to establish color conversion

processing service as business.

[0020]

[Embodiments of the Invention]

Fig. 1 is a configuration diagram showing one embodiment of a color conversion system of the invention. In the figure, numeral 1 denotes a conversion server, numerals 2, 3 and 4 denote client systems, numeral 5 denotes the Internet, numerals 11, 22, 32 and 42 denote communication sections, numeral 12 denotes a color conversion section, numeral 13 denotes a color conversion information storage section, numeral 14 denotes a rasterizing section, numeral 15 denotes a charging section, numerals 21, 31 and 43 denote output units, and numeral 41 denotes an instruction terminal. In the color conversion system shown in Fig. 1, the color conversion server 1 and the client systems 2, 3 and 4 are connected via the Internet 5. For example, the color conversion system can be configured so that the client systems 2 and 3 are installed in the orderer and the printing company, and the client system 4 is installed in the production company. Of course, the client systems connectable to the color conversion server 1 are noted limited to three, the color conversion system can be configured so that desired number of client systems is connectable thereto. Here, the Internet 5 is shown as intercommunication path. However, every communication form regardless of wired or radio, such as a telephone line, an exclusive line and a LAN, can be used.

[0021]

The color conversion server 1 includes the communication section 11, the color conversion section 12, the color conversion information storage section 13 and the rasterized section 14. The communication section 11 receives image data and instruction information specifying an output unit through the Internet 5. Then, the communication section 11 inputs the received image data and instruction information to the color conversion section 12. Also, the communication section 11 transfers the image data, which undergone color conversion processing in the color conversion section 12, or image data, which is converted into raster data in the rasterizing section 14, to client systems in accordance with the instruction information.

[0022]

The color conversion section 12 extracts color conversion information corresponding to the output device specified by the instruction information from the color conversion information storage section 13, and performs the color conversion processing for the image data in accordance with the color conversion information. The color conversion information storage section 13 stores the color conversion information corresponding to the respective output units. The color conversion information are set so that a color output by an output device on a basis of image data is a target color. Thus, since the color conversion section 12 performs the color

conversion processing using the color conversion information, when the output device outputs the image data undergone the color conversion processing, an image has almost the same color reproduction as the target color.

[0023]

For example, the target color may be set to a color, which is reproduced in a proof conventionally used. The color conversion information is set so that the target color is reproduced by the respective output units. The output units are different in color reproduction characteristics, depending on printing system, model and machine property. The color conversion information storage section 13 stores the color conversion information used in the color conversion processing in advance, with considering the color reproduction characteristics of the respective output units. If the color conversion processing is performed using the color conversion processing corresponding to the output unit, when image data is output by the output unit, the output image is color-reproduced with substantial target image. Accordingly, whenever any output device outputs, the same color reproduction can be achieved, and it is possible to achieve the same color reproduction as the conventional proof.

[0024]

FIG. 2 is a schematic representation of an example of the configuration of the color conversion information storage

section 13. In the example shown in FIG. 2, the color conversion information is stored with being associated with the output devices and the target colors. For example, when the target color is target A and an image is output on the output unit 21 in the client system 2, color conversion information a is used to execute color conversion. Likewise, when the target color is target A and an image is output on the output unit 31 in the client system 3, color conversion information b is used to execute color conversion. Accordingly, the reproduced colors of the image output on the output unit 21, the image output on the output unit 31, and the printed image can be almost matched with each other.

[0025]

Even when output is produced on the same output device, for example, if the printer for finally printing printed matter differs, such color conversion information is used that color reproduction almost matches the target color responsive to the characteristic of the printer. For example, in a case of outputting on the output unit 21 in the client system 2, if the target color is target A, color conversion information a is used to execute color conversion; if the target color is target B, color conversion information c is used to execute color conversion. Accordingly, color reproduction responsive to the printer, etc., can be accomplished.

[0026]

Each piece of color conversion information can be provided, for example, by measuring a result of outputting color patch on an output device and comparing the color measurement value with the target color corresponding to the color patch. Such color conversion information is previously registered in the color conversion information storage section 13 in the color conversion server 1. Calculation processing to provide such color conversion information can also be performed in the color conversion server.

[0027]

Turning to Fig. 1, when received image data is data described in description language such as PDL and is transferred to an output unit as raster data, the rasterizing section 14 converts the image data undergone the color conversion processing in the color conversion section 12 into the raster data. For example, if the conversion processing is performed while holding many fonts and special fonts, it is not necessary for each client system to hold expensive and large amount of font data. When the received image data is raster data or when an output unit to which a processing result is transferred is a device for receiving data described in description language such as PDL and outputting, it is not necessary to perform the processing in the rasterizing section 14. Also, there is no need to convert into the raster data, the rasterizing section 14 may not be provided. In the case where the rasterizing section



14 is provided, the rasterizing section 14 and the color conversion section 12 are included in color conversion means.

[0028]

The charging section 15 charges for the color conversion processing of the color conversion section 12, the rasterizing processing of the rasterizing section 14, or a combination thereof. The color conversion processing requesting party or the party to whom the image data undergone the color conversion processing is transferred can be charged. Various charging systems on an as-used basis of the data size, the number of pages, the processing time, etc., on a fixed-price basis, or on a combined basis, such as an upper limit cap, can be applied. The charging system can also be switched in response to various settings as to whether or not the processing is urgent, whether or not a high-performance output device (not shown) installed in the color conversion server 1 is used for outputting, whether the image data is monochrome or color, etc.

[0029]

The client systems 2 to 4 are provided with communication sections 22, 32, and 42 for communicating with the color conversion server 1 and can communicate with the color conversion server 1 through the Internet 5. In the example, the client systems 2, 3, and 4 are also provided with output units 21, 31, and 43 and can output the image data undergoing color conversion processing performed by the color conversion server

1. Thus, the client system 2 can receive the image data sent from the color conversion server 1 at the communication section 22 and can print out the image data on the output unit 21. Likewise, the client system 3 or 4 can receive the raster data sent from the color conversion server 1 at the communication section 32 or 42 and can print out the raster data on the output unit 31 or 43. Accordingly, the output unit 21, 31, or 43 can provide an image reproduced in a similar color to the target color. There may be a client system provided with no output device, or two or more output devices may exist in one client system. The output devices need not adopt the same print technology or need not be of the same model and may adopt different print technologies or may be of different models. Of course, the output device may be a display unit, etc.

[0030]

The client system 4 is further provided with the above-mentioned instruction terminal 41. In the example, it is assumed that the client system 4 is a printed matter production system, and printed matter is designed, etc., and image data is prepared. At this time, the instruction terminal 41 may be used. The prepared image data together with instruction information specifying at least the output device is sent from the instruction terminal 41 to the color conversion server 1 and the color conversion server 1 is requested to perform color conversion processing. For example, if the color information

for each target color as shown in FIG. 2 is stored in the color conversion server 1, specification of the target color is also sent to the color conversion server 1 as the instruction information. For example, even in a case of outputting to the output device 43 in the client system 4, the image data may be sent to the color conversion server 1 with specification of output to the output device 43 to match the color reproducibility with the target color.

[0031]

The image data is arbitrary and may be, for example, code data using PDF, HTML/XML, etc., prepared in the instruction terminal 41 or any other computer, bit map data prepared using a graphics function, an image read through an image reader, or a mixture thereof. The image data undergone color conversion may be in any format; when the color conversion server 1 is requested to perform color conversion processing, the format can be specified or the data format in which data can be received for each output device can be registered.

[0032]

Next, an example of the operation of the color conversion system of the invention will be discussed. Here, the operation of the color conversion system for printing out an image on the output unit 31 in the client system 3 as instructed from the instruction terminal 41 in the client system 4 will be discussed briefly.

[0033]

Before color conversion processing is performed, the color conversion information corresponding to the output unit 31 in the client system 3 needs to be stored in the color conversion information storage section 13 in the color conversion server 1. The color conversion information can be provided, for example, by outputting a color patch image on the output device, measuring the color of the image with a color measuring instrument, etc., and comparing the measured color with the target color of the same color patch image. Such color conversion information pieces are previously found for a plurality of target colors and in addition, the color measurement data of the color patch image is retained and when conversion to a new target color is required and color conversion information becomes necessary, it may be prepared. The color conversion information thus stored in the color conversion information storage section 13 can be later changed. It is advisable to change the color conversion information whenever necessary in response to change in the color reproducibility caused by change of the output device with time, replacement of the parts, etc., for example.

[0034]

Through the instruction terminal 41, an instruction is given for transmitting image data of printed matter and instruction information specifying the output unit 31 in the

client system 3 as the output destination to the color conversion server 1. Then, the communication section 42 transmits the image data and the instruction information through the Internet 5 to the color conversion server 1. As for the specification of the output device, for example, if only one output device exists in each client system as shown in FIG. 1 or one representative output device is set in each client system, only the client system to which the image data undergone color conversion processing is to be transferred may be specified.

[0035]

The color conversion server 1 receives the image data and the instruction information sent from the client system 4 at the communication section 11 and passes them to the color conversion section 12. The instruction information may also be retained in the communication section 11. The color conversion section 12 acquires the color conversion information corresponding to the output unit 31 specified as the output destination (further, the target color) in the instruction information and performs color conversion processing for the image data according to the obtained color conversion information. Further, if an instruction to convert the image data into raster data is given or if the received image data is in a data format that cannot be accepted in the output unit 31, the image data undergone the color conversion processing is passed to the rasterizing section 14, which then converts

the image data into raster data.

[0036]

For example, if the image data prepared in the client system 4 is data described in PostScript (registered trademark) and the output unit 31 can output the data in the data format intact, the color conversion section 12 performs only color conversion processing for color information in the image data and the image data undergone the color conversion processing is not converted into raster data. If the output unit 31 cannot output the data in the data format without conversion or if an instruction to convert the image data into raster data is given as a part of instruction information from the client system 4, the rasterizing section 14 converts the image data undergone the color conversion processing into raster data.

[0037]

The charging section 15 charges for the color conversion processing of the color conversion section 12. If the rasterizing section 14 rasterizes the image data, the charging section 15 can also charge for the rasterizing processing.

[0038]

The image data undergone the color conversion processing of the color conversion section 12 or the image data converted into raster data by the rasterizing section 14 is transferred through the communication section 11 to the client system 3 via the Internet 5. The client system 3 receives the image

data transferred via the Internet 5 at the communication section 32 and sends the image data to the output unit 31. Accordingly, an image can be printed out from the output unit 31.

[0039]

Thus, the image data prepared in the client system 4 undergoes color conversion processing in the color conversion server 1 using the color conversion information corresponding to the output unit 31 and further is rasterized as required and the data is transferred to the output unit 31 in the client system 3 for output. At this time, the color conversion section 12 in the color conversion server 1 performs color conversion processing so that almost the same color as the target color is reproduced upon output of the output unit 31 in the client system 3. Therefore, the image output on the output unit 31 in the client system 3 is reproduced in almost the same color as the target color; the image reproduced in a color almost similar to that when printed on a printer, for example, can be provided. To output the image data prepared in the client system 4 on the output device 41 in the same client system 4 or print out on the output unit 21 in the client system 2, a similar manner can also be applied.

[0040]

Using the color conversion system of the invention, for example, in the production process of general printed matter previously described with reference to FIG. 5, the color image

processing system is constructed with the systems in the client 61, the production company 62, the plate-making company 63, etc., as the client systems (particularly, the system in the production company 62 as the client system 4 in FIG. 1), whereby the comprehensive layout 72 prepared in the production company 62 can be output on the printer installed in the client 61. In this case, as color conversion processing is performed in the color conversion server 1, color conversion processing responsive to the printer installed in the client 61 and the used printer 91 is performed and thus color reproduction almost equivalent to that on the proof 86 prepared in the plate-making company 63 can also be provided on the printer installed in the client 61. Thus, the comprehensive layout 72 prepared in the production company 62 can be handled like the proof 86 and color proofreading can also be conducted at the stage of the comprehensive layout 72 to some extent. Therefore, as compared with the case where color proofreading is conducted with the proof 86 after the films 82, the PS plates 84, etc., are prepared as in the related art, the number of times proofreading is performed using the proof 86 is decreased exceptionally, the correction cost and time can be reduced greatly, and the manpower, etc., can also be made efficient with the visits of each sales representative lessened. Of course, if the client 61 consents to the design, color, etc., at the stage of the comprehensive layout 72, up to printing can be executed without preparing



the proof 86 and the cost, time, etc., can be more reduced.

[0041]

If facilities similar to those of the plate-making company 63 are also installed in the client 61 or the production company 62, output equivalent to the proof 86 can be produced. However, using the color conversion system of the invention, the client 61 or the production company 62 can output an image reproduced in a color similar to that of the proof 86 simply by installing a reasonable-price output device without installing expensive facilities.

[0042]

Further, output is also produced in the same target colors in the plate-making company 63 and the printing company 64, whereby the color tone intended by the production company 62 and the client 61 can be reproduced intact. For example, when the plate-making company 63 receives the image data approved by the client 61 from the production company 62, if an image printed on an output device from the image data is brought into the printing company 64 as the proof 86 together with the film 82, the intended printed matter 92 can be finished. Further, if output corresponding to the proof 86 is produced on an output device of the printing company 64, the intended printed matter 92 can be provided simply by bringing the film 82 into the printing company 64.

[0043]

When the color conversion server 1 is requested to output the image data prepared in the production company 62 onto any output device installed in the client 61, the production company 62, the plate-making company 63, the printing company 64, etc., if an erroneous target color is specified, the reproduced color also differs from the intended color. To prevent such a mistake, for example, target color specification information may be always related to the image data or they may be placed in one piece. Alternatively, process management is executed for the image data and at the time, the target color, the output device, and the like can also be automatically specified for preventing an instruction (specification) information error from occurring.

[0044]

As described above, using the color conversion system of the invention, the color almost similar to the target color can be reproduced on each output device with the reproduced color at the printing time as the target color, for example. However, to provide precise color reproduction, the color conversion processing amount is large. However, strict color reproducibility may not be required depending on the preparation stage of printed matter, for example, at the proofreading stage of initial layout design, etc. In such a case, color conversion processing with a large load need not necessarily be performed. To deal with such a case, it is advisable to rank color conversion

processing.

[0045]

FIG. 3 is a schematic representation of another example of the configuration of the color conversion information storage section. The accuracy of color conversion processing is determined by the color conversion information preparation method, the color conversion processing method, etc., to some extent. Thus, to rank the color conversion processing, it is possible to previously store the color conversion information responsive to each rank in the color conversion information storage section 13. In the example shown in FIG. 3, the color conversion information is subdivided into a plurality of ranks for storage with being associated with the output devices and the target colors. For example, assuming that rank 1 is the highest accuracy, at the initial stage of printed matter preparation, a large rank value may be specified for executing color conversion processing. As the process approaches determination of color, etc., a small rank value may be specified for executing color conversion processing and when color proofreading, etc., is conducted or output is produced in the plate-making company or the printing company, rank 1 may be specified for executing color conversion processing. As for the color conversion information responsive to the rank of the color conversion accuracy, for example, when a color patch image is used to prepare color conversion information, the accuracy

can be ranked according to the number of used color patches.

[0046]

In the example, the color conversion information responsive to a plurality of ranks is stored with being associated with the output devices and the target colors, but the color conversion information with low color conversion accuracy, for example, can also be made common for use to some extent.

[0047]

In a case of thus ranking the color conversion processing, if color conversion processing with low color conversion accuracy is performed, the load of the color conversion server 1 can be lessened. In order to return this merit due to reduction of the load to user, the charging section 15 may charge in accordance with rank. For example, fees may be set for each rank, and when the color conversion processing is performed with low color conversion accuracy, the color conversion processing may be performed with low charge.

[0048]

FIG. 4 is a block diagram to show another example of color conversion server. Parts similar to those previously described with reference to FIG. 1 are denoted by the same reference numerals in FIG. 4 and will not be discussed again. In FIG. 4, numerals 12-1 to 12-N denote color conversion sections and numerals 14-1 to 14-M denote rasterizing sections. In the

example, the color conversion server 1 contains the N color conversion sections 12-1 to 12-N and the M rasterizing sections 14-1 to 14-M. Each of the color conversion sections 12-1 to 12-N is similar to the above-described conversion section 13 and each of the rasterizing sections 14-1 to 14-M is similar to the above-described rasterizing section 14. A plurality of the color conversion sections and a plurality of the rasterizing sections are thus provided, so that the color conversion server 1 can respond to color conversion processing and rasterizing processing requests sent from a larger number of client systems.

[0049]

When a color conversion processing request sent from one of the client systems is accepted at a communication section 11, if any of the color conversion sections 12-1 to 12-N is idle, the idle color conversion section is selected; if the color conversion sections 12-1 to 12-N are all busy, the request is added to a queue. In this case, which of the color conversion sections 12-1 to 12-N is to execute which of the requests placed in the queue is controlled depending on the processing load on each color conversion section, etc., for example, whereby efficient color conversion processing can be executed.

[0050]

Likewise, for image data for which color conversion processing is to be performed in any of the color conversion

sections 12-1 to 12-N and is further to be rasterized, when a request is accepted or during or after the color conversion processing, which of the rasterizing sections 14-1 to 14-M is to rasterize the data is determined. If any of the rasterizing sections 14-1 to 14-M is idle, the idle rasterizing section is selected; if the rasterizing sections 14-1 to 14-M are all busy, the image data is added to a queue. In this case, which of the rasterizing sections 14-1 to 14-M is to rasterize which of the image data pieces placed in the queue is controlled depending on the processing load on each rasterizing section, etc., for example, whereby efficient rasterizing processing can be executed.

[0051]

In the example, a plurality of the color conversion sections and a plurality of the rasterizing sections are provided, but a plurality of the color conversion sections and one rasterizing section or one color conversion section and a plurality of the rasterizing sections can also be provided. Generally, rasterizing processing takes longer time than color conversion processing and thus a larger number of rasterizing sections may be provided in a situation in which much image data is rasterized.

[0052]

In the description of the embodiment, the color conversion information stored in the color conversion information storage

section 13 of the color conversion server 1 is used only in the color conversion server 1. However, for example, the color image processing system may be configured so that the color conversion information stored in the color conversion information storage section 13 can be downloaded into the client system. Any desired color conversion information of the downloaded color conversion information may be selected and transferred to the color conversion server 1 as a part of instruction information together with image data for requesting the color conversion server 1 to perform color conversion processing for the image data. The color conversion server 1 may use the color conversion information sent from the client system to perform color conversion processing by the color conversion section 12. However, to always provide color reproducibility with high accuracy, it is desired that the color conversion information transferred to the color conversion server 1 should always be updated to the most recent information.

[0053]

If the output device has the color conversion processing function using color conversion information, the color conversion server 1 may transfer the color conversion information corresponding to instruction information together with image data to the output device without performing color conversion processing. In this case, color conversion processing is performed in the output device in accordance with

the color conversion information sent from the color conversion server 1. Also in this case, the color conversion information is information set so as to provide the same output color as the target color in the output device and thus if color conversion processing is performed and output is produced, almost the same color as the target color can be reproduced. Transferring the color conversion information to the output device or performing color conversion processing in the color conversion server 1 can be selected in response to the output device. If the output device does not have the function of reading the color conversion information and performing color conversion processing, color conversion processing may be performed in the color conversion server 1 as described above. Even if the color conversion information is transferred to the output device, rasterizing processing for the image data may be performed in the color conversion server 1.

[0054]

[Advantages of the Invention]

As seen from the description made above, according to the invention, color conversion processing is performed in response to each output device so that the color output on the specified output device becomes the target color, and thus almost similar color reproduction can be accomplished on every output device. The final printed matter color is specified as the target color, whereby if the image data undergone color



conversion is output to any output devices, almost similar color reproduction can be accomplished. Accordingly, for example, if the image data prepared in the production company is printed out on a printer in the company, a printer installed in the client, and a printer in the plate-making company, images reproduced in almost similar colors can be provided. At this time, the need for installing an expensive color conversion apparatus for each output device as in the related art is eliminated and color conversion processing can be performed with high accuracy at low costs. Therefore, reasonable color proofreading can be completed before plate making without conducting final color proofreading using a proof at the plate making time as in the related, the required time can be shortened, the costs can be reduced, and the manpower for transporting proofs, etc., can be decreased. Thus, according to the invention, the color image processing system can be used in each process of preparing printed matter and the printed matter preparation process in the related art can be changed to electronization.

[Brief Description of the Drawings]

[Fig. 1] A configuration diagram showing one embodiment of a color conversion system of the invention

[FIG. 2] An explanatory diagram showing of an example of the configuration of a color conversion information storage section.

[FIG. 3] An explanatory diagram showing of another example of the configuration of the color conversion information storage section.

[FIG. 4] A configuration diagram showing another example of color conversion server.

[Fig. 5] An explanatory drawing showing an example of an outline of a production process of general printed matter.

[Description of Numerals]

1 ... color conversion server, 2, 3, 4 ... client systems, 5 the Internet, 11, 22, 32, 42 ... communication sections, 12 ... color conversion section, 13 ... color conversion information storage section, 14 ... rasterizing section, 15 ... charging section, 21, 31, 43 ... output units, 41 ... instruction terminal, 61 client, 62 ... production company, 63 ... plate-making company, 64 ... printing company, 71 ... production system, 72 ... comprehensive layout, 81 ... image setter, 82 ... film, 83 ... plate-making, 84 ... PS plate, 85 ... flatbed proofreading machine, 86 ... proof, 91 printer, 92 ... printed matter

[Name of Document] Abstract

[Abstract]

[Object] To provide a color conversion system and a color conversion server, which can obtain an image of a printed matter, which has the same color reproduction as the final printed matter, at any stage and with any output device.

[Solving Means] A color conversion information storage section 13 stores in advance color conversion information, which are set so that color output by an output device 21, 31, 41 provided in a client system 2-4 on a basis of image data is a target color, with associating the color conversion information with each output device. For example, the image data and instruction information specifying the output unit 31 are sent from the client system 4 to the color conversion server 1. Then, the color conversion section 12 extracts color conversion information corresponding to the output unit 31 from the color conversion information storage section 13, and performs color conversion processing for the image data using the color conversion information. Then, the image data undergone the color conversion processing is transferred to the output unit 31. If the output unit 31 outputs on a basis of the image data, which is transferred and undergone the color conversion processing, color reproduction same as a target color can be realized.

[Selected Drawing] Fig. 1

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特願2001-013448 頁: 1/ 4

【書類名】 図面 Drawing

【図1】  
Name of Document

Fig. 1

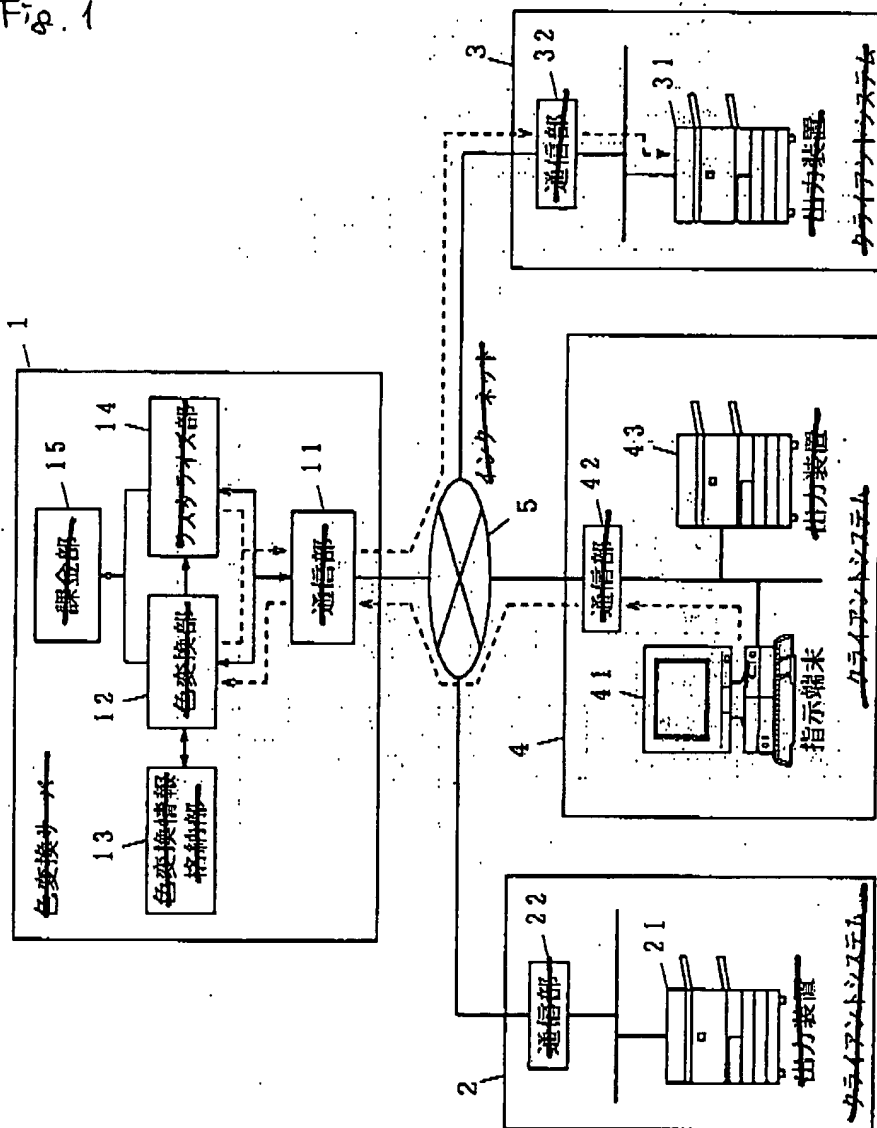


FIG. 1

- 1 COLOR CONVERSION SERVER
- 2 CLIENT SYSTEM
- 3 CLIENT SYSTEM
- 4 CLIENT SYSTEM
- 5 THE INTERNET
- 11 COMMUNICATION SECTION
- 12 COLOR CONVERSION SECTION
- 13 COLOR CONVERSION INFORMATION STORAGE SECTION
- 14 RASTERIZING SECTION
- 15 CHARGING SECTION
- 21 OUTPUT UNIT
- 22 COMMUNICATION SECTION
- 31 OUTPUT UNIT
- 32 COMMUNICATION SECTION
- 41 INSTRUCTION TERMINAL
- 42 COMMUNICATION SECTION
- 43 OUTPUT UNIT

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[図2]

Fig. 2

|                   | クライアントシステム2 | クライアントシステム3 | ... |
|-------------------|-------------|-------------|-----|
|                   | 出力装置21 (3)  | 出力装置31 (4)  | ... |
| target A ~ ターゲットA | 色変換情報a (5)  | 色変換情報b (6)  | ... |
| target B ~ ターゲットB | 色変換情報c (7)  | 色変換情報d (8)  | ... |
| target C ~ ターゲットC | 色変換情報e (9)  | 色変換情報f (10) | ... |
| ...               | ...         | ...         | ... |

Fig. 3

[図3]

|                   | クライアントシステム2 |              | クライアントシステム3  |              | ... |
|-------------------|-------------|--------------|--------------|--------------|-----|
|                   | 出力装置21 (3)  |              | 出力装置31 (4)   |              | ... |
|                   | リンク1        | リンク2 (6)     | リンク1         | リンク2 (7)     | ... |
| target A ~ ターゲットA | 色変換情報a1 (1) | 色変換情報a2 (2)  | 色変換情報b1 (3)  | 色変換情報b2 (4)  | ... |
| target B ~ ターゲットB | 色変換情報c1 (5) | 色変換情報c2 (6)  | 色変換情報d1 (7)  | 色変換情報d2 (8)  | ... |
| target C ~ ターゲットC | 色変換情報e1 (9) | 色変換情報e2 (10) | 色変換情報f1 (11) | 色変換情報f2 (12) | ... |
| ...               | (13)...     | (14)         | ...          | ...          | ... |

## FIG. 2

- (1) CLIENT SYSTEM 2
- (2) CLIENT SYSTEM 3
- (3) OUTPUT UNIT 21
- (4) OUTPUT UNIT 31
- (5) COLOR CONVERSION INFORMATION A
- (6) COLOR CONVERSION INFORMATION C
- (7) COLOR CONVERSION INFORMATION E
- (8) COLOR CONVERSION INFORMATION B
- (9) COLOR CONVERSION INFORMATION D
- (10) COLOR CONVERSION INFORMATION F

FIG. 3

- (1) CLIENT SYSTEM 2
- (2) CLIENT SYSTEM 3
- (3) OUTPUT UNIT 21
- (4) OUTPUT UNIT 31
- (5) RANK 1
- (6) RANK 2
- (7) RANK 1
- (8) RANK 2
- (9) COLOR CONVERSION INFORMATION A1
- (10) COLOR CONVERSION INFORMATION A2
- (11) COLOR CONVERSION INFORMATION C1
- (12) COLOR CONVERSION INFORMATION C2
- (13) COLOR CONVERSION INFORMATION E1
- (14) COLOR CONVERSION INFORMATION E2
- (15) COLOR CONVERSION INFORMATION B1
- (16) COLOR CONVERSION INFORMATION B2
- (17) COLOR CONVERSION INFORMATION D1
- (18) COLOR CONVERSION INFORMATION D2
- (19) COLOR CONVERSION INFORMATION F1
- (20) COLOR CONVERSION INFORMATION F2





FIG. 4

- 1 COLOR CONVERSION SERVER
- 2 CLIENT SYSTEM
- 3 CLIENT SYSTEM
- 4 CLIENT SYSTEM
- 5 THE INTERNET
- 11 COMMUNICATION SECTION
- 12-1 COLOR CONVERSION SECTION
- 12-2 COLOR CONVERSION SECTION
- 12-N COLOR CONVERSION SECTION
- 14-1 RASTERIZING SECTION
- 14-2 RASTERIZING SECTION
- 14-N RASTERIZING SECTION 15 CHARGING SECTION

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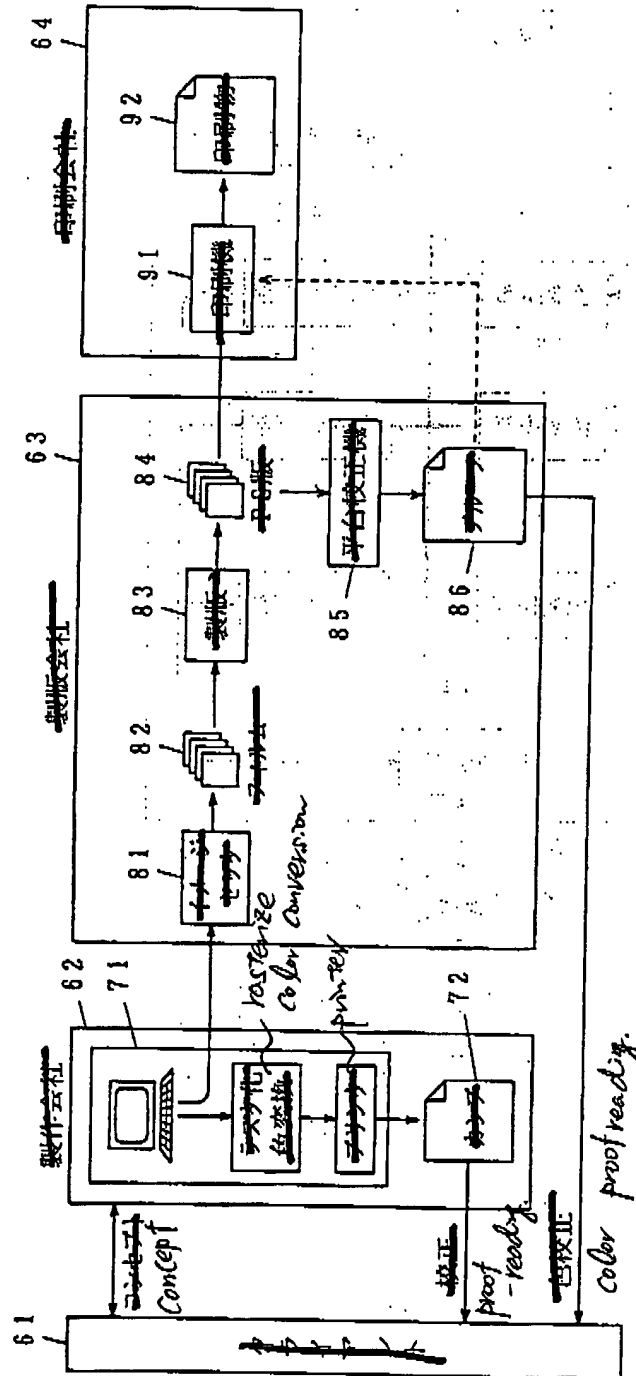
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(図5)

Fig. 5



## FIG. 5

- 61 client
- 62 production company
- 63 plate-making company
- 64 printing company
- 72 comprehensive layout
- 81 ... image setter
- 83 plate-making
- 84 PS plate
- 85 flatbed proofreading machine
- 86 proof
- 91 printer
- 92 printed matter

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